

REMARKS

The Applicant and the Applicant's undersigned attorney are very appreciative to the Examiner for the telephone interview on Wednesday, December 14, 2005, to discuss the claims. The Applicant's undersigned attorney has received and reviewed the Examiner's Interview Summary dated December 20, 2005, and agrees with it – it reflects a true and accurate summary of the interview. The Applicant confirms that the exhibit concerned proposed claim language directed to methods in the absence of an oxidizer breaker. As a result of the Interview, similar language is formally presented herein for the Examiner's consideration.

The claims remaining in the application are 1, 4, 6, 8, 9, 11 through 13 and 23-28. Claims 1 and 9 are amended. Claims 5 and 7 are newly canceled. Claims 23-28 are new. It is respectfully submitted that no new matter has been added. Reconsideration of the amended claims and consideration of the new claims are respectfully requested.

Objection to Specification

The Examiner objected to the specification because of the following informalities: the cross-noting section of the specification should update the status of the parent application. Appropriate correction is required.

The Applicant is confused because the cross-reference to parent application U.S. Serial No. 10/086,963 was updated in the Second Preliminary Amendment filed April 23, 2004 to note that it issued as U.S. Pat. No. 6,706,769 B2 on March 16, 2004. If further updating is believed necessary, the Applicant respectfully requests the Examiner to be more specific about the nature of the updating, *i.e.* what additional information should be included. Reconsideration is respectfully requested.

35 U.S.C. §102(b) Rejection Over Dawson, et al.

The Examiner has rejected claims 1, 4-7, 9 and 11-12 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Pat. No. 5,624,886 to Dawson, et al. The Examiner finds that Dawson, et al. discloses the formation of gels employing hydroxypropyl guar and employs a breaker composition employing EDTA salts among other ingredients and

cross-links the composition with zirconium lactate. Zirconium lactate is not a borate cross-linker. The Examiner notes that the claims do not exclude the further ingredients in the gel breaker.

The Applicant must respectfully traverse.

A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, 52 F.3d 1043, 1047, 34 U.S.P.Q.2d 1565 (Fed. Cir.), cert. denied, 116 S.Ct. 516 (1995).

The Examiner's attention is respectfully directed to the amendments to the only independent claims in the application, 1 and 9, which have been amended to recite "in the absence of an oxidizer effective to break viscosity within the temperature ranges". Applicant respectfully submits that support for this language is found in the application as filed at the end of paragraph [0018], page 4, lines 4-6 where it is noted that the "The gel breaking method of this invention is expected to be an attractive *alternative* to using enzyme technology or catalyzed oxidizer technology to break gels within this temperature range." (Emphasis added.) By "alternative" it is clear that the recited method is *in place of* and thus in the absence of an oxidizer effective to break the viscosity within the claimed temperature ranges. It should be understood that the present language of claims 1 and 9 encompass an oxidizer that does not break gels within the temperature range. New dependent claims 23 and 24 are similar in that the claimed method is alternative to enzymes to break viscosity within the temperature ranges, and thus these claims are also not an improper insertion of new matter.

Dawson, et al. relates to a method for fracturing a subterranean formation in which a hydratable polymer, crosslinking agent and breaker are combined in an aqueous carrier to form a gelled fracturing fluid. The breaker is comprised of a substantially insoluble *oxidant* which is granulated and formed into a pellet or prill with a suitable binder. The pellet so formed can also contain a *chelating agent* and an activator in order to enhance the rate of breaking. The substantially insoluble *oxidant* is selected from the group consisting of alkaline earth and zinc salts of peroxide, perphosphate, perborate, and percarbonate. (Please see the Abstract.)

Dawson, et al. only teaches that the chelant chemicals therein are used in conjunction or together with oxidant or oxidizer breakers, suggesting that the use of the chelant chemicals controls the rate of polymer oxidation. However, it is not possible from Dawson, et al. to tell if this is true since the oxidizer (calcium peroxide) is not employed by itself, but is always exemplified with a chelant (iron (III) EDTA and Na₂EDTA).

Additionally, the method of breaking is taught in all cases, such as in column 6 line 7, as "polymer oxidation". The Dawson, et al. pellet compositions require using a "substantially insoluble oxidizer", as listed in column 5, lines 16, 24, 34-35, the claims and elsewhere. The specific types of substantially insoluble oxidants are listed in column 5, lines 34-55. The use of chelants is based on enhancing the rate of the substantially insoluble oxidant polymer oxidation activity, and are not taught, mentioned or suggested as stand alone polymer breakers themselves. There appears there is no suggestion that the chelants alone will be or can be used as a polymer breaker *per se*.

Thus, because the single prior art reference does not teach each and every limitation of the claims as amended, namely the absence of an oxidizer as recited, it is respectfully submitted that the subject rejection should be withdrawn. Reconsideration is respectfully requested.

35 U.S.C. §102(b) Rejection Over Smith, et al.

The Examiner has rejected claims 1, 4-9 and 11-13 under 35 U.S.C. §102(b) as allegedly being anticipated by U.S. Pat. No. 5,224,546 to Smith, et al. The Examiner finds that Smith, et al. discloses guar gels cross-linked with titanium complex and employing as a gel breaker EDTA in concentrations of about 1, 2, 3 or 4 pptg. Table 2 therein is seen by the Examiner to denote the use of a 20% EDTA active set for as gal. The Examiner finds that the use of 0.4 gal of 20% EDTA active/1000 gal fluid is about 1 lb EDTA/1000 gal fluid. The use of 0.8 gal of 20% EDTA active/1000 gal fluid is found to be about 2 EDTA/1000 gal fluid. The Examiner further notes that gels cross-linked with titanium complex are absent a borate cross-linker.

The Applicant must respectfully traverse.

A patent claim is anticipated, and therefore invalid, only when a single prior art reference discloses each and every limitation of the claim. *Glaxo Inc. v. Novopharm Ltd.*, *id.*

Smith, et al. permits the use of oxidizers as shown at column 4, lines 35-36: “Mild *oxidizing agents* are useful as breakers when a fluid is used in a relatively high temperature formation”, and column 5, lines 62-64: “In practicing the present invention, conventional breakers, i.e. *oxidizers* or enzymes, may also be used” (emphasis added). As previously discussed, the claims as amended herein recite the “absence of an oxidizer effective to break viscosity within the temperature ranges”. Because Smith, et al. permits the presence of oxidizers or oxidizing agents, the Applicant respectfully submits that the single Smith, et al. reference does not teach each and every limitation of the claims, as amended. Smith, et al. doesn’t teach the absence of an oxidizer as recited in the claims as amended. For this reason alone, it is respectfully submitted that the amended claims are not anticipated by Smith, et al.

Further, the Applicant respectfully submits that Smith, et al. explicitly, repeatedly and consistently teaches reducing the viscosity of a viscous crosslinked polymer gel composition whereby “said carboxylated chelating agent ester having a chemical association with said metal ion which is less than the chemical association of said polymer with said metal ion, but the carboxylated chelating agent released when said ester is hydrolyzed having a chemical association with said metal ion which is greater than the chemical association of said crosslinked polymer with said metal ion whereby said polymer is uncrosslinked and the viscosity of said composition is reduced”; please see Smith, et al. column 2, lines 31-41; claim 1, column 9, line 68 to column 10, line 9; and claim 8, column 10, lines 51-63. Smith, et al. is silent about the chemical association between the carboxylated chelating agent and the polymer *per se*.

The Applicant herein has repeatedly demonstrated that the claimed aminocarboxylic acids act directly on the polymer itself, as seen especially in Examples 6 and 7 of the application as filed and in Examples 10 and 11 of the Declaration Under 37 CFR 1.132 submitted April 23, 2004. This step is explicitly recited in the independent claims herein as “adding an effective amount of at least one aminocarboxylic acid to break down the gel by acting ... primarily directly on the polymer gel”. Applicant respectfully submits

that the single Smith, et al. reference does *not* disclose this “each and every” limitation of the claim, and thus for this reason alone the subject rejection based upon Smith, et al. should be withdrawn.

Further the Applicant would respectfully direct the Examiner’s attention to new claims 27 and 28 where the list of suitable aminocarboxylic acids is reduced to “PDTA, HEDTA, HEDTA, H₂EDDA, salts of these acids, and mixtures thereof”. The Applicant respectfully requests the Examiner to note that EDTA, H₂O EDTA and NTA are not recited in claims 27 and 28.

In contrast, the Applicant notes that Smith, et al. explicitly, repeatedly and consistently teaches that the hydrolyzable carboxylated chelating agent esters are ethylenediaminetetraacetic acid esters, nitrilotriacetic acid esters, citric acid esters and hydroxyacetic acid esters. The Examiner’s attention is respectfully directed to column 2, lines 64-66; column 5, lines 14-50; the Examples; claim 1, column 9, lines 65-68; claim 10, column 11, lines 11-12. The Applicant respectfully submits that the single Smith, et al. reference does not disclose teach or suggest each and every limitation of new claims 27 and 28, and that these claims also avoid any 35 U.S.C. §102(b) rejection based upon Smith, et al. for this reason alone. Consideration of these new claims is respectfully requested.

For all of these reasons, the Applicant urges that the claims as amended or as new overcome and/or avoid the instant rejection.

35 U.S.C. §103(a) Rejection Over Chang, et al.

The Examiner has rejected claims 1, 4-9 and 11-13 under 35 U.S.C. §103(a) as allegedly being obvious from U.S. Pat. No. 5,981,447 to Chang, et al. The Examiner finds that Chang, et al. discloses the addition of 0 to 100 lbm/1000 gal (pptg) in a HEC (hydroxyethylcellulose) gel forming and breaking system.

The Examiner admits that Chang, et al. differs from the claims in the use of HEC rather than guar gum. The Examiner finds that Chang, et al. discloses a number of guar and derivatized guar as suitable hydratable polymers useful in the disclosed systems.

The Examiner contends however, that it would have been obvious to one of ordinary skill in the art at the time of Applicant’s invention to employ guar and/or derivatized

guar as a hydratable polymer for forming the gels of Chang, et al. as an allegedly obvious functional equivalent of the HEC polymers exemplified for the art known gel function taught in the Chang, et al. reference.

The Applicant respectfully traverses.

To support an obviousness rejection, the Examiner has the initial burden of establishing a *prima facie* case of obviousness of the pending claims over the cited prior art, *In re Oeticker*, 977 F.2d 1443, 1445; 24 U.S.P.Q.2d 1443 (Fed. Cir. 1992).

Chang, et al. concerns chemical systems and methods to stop or minimize fluid loss during completion of wells penetrating hydrocarbon formations. The chemical system contains a linear HEC polymer solution, a low solubility compound which slowly raises the fluid pH, a chelating agent which further increases the pH level beyond the equilibrium achievable by the low solubility compound, a metal crosslinker which crosslinks HEC at elevated pH, and a crosslink delaying agent which allows fluid viscosity to remain low until the fluid reaches the subterranean formation (please see the Abstract therein). The only breakers taught by Chang, et al. are primarily oxidizer breakers and to a lesser extent enzyme breakers. The Examiner's attention is respectfully directed to column 5, lines 27-30: "Various *oxidizing breakers* and catalysts may be applied to produce the most effective viscosity reduction at specific temperatures." (emphasis added), which sentence is repeated at column 6, lines 46-48. Note also the footnote to Table A (column 8, lines 13-14: "Different *oxidizers* are used as breakers for different temperature applications." (Emphasis added.) In particular, please see the entire section from column 9, line 58 to column 10, line 54 (end of Table D) where oxidizer breakers are discussed in detail. Please also see the section "5. Internal Breakers" from column 19, line 49 to column 20, line 3.

It is respectfully submitted that Chang, et al. primarily and overwhelmingly considers oxidizers as the suitable breakers therein. The independent claims as amended herein explicitly recite the absence of the oxidizer breakers. Chang, et al. does not teach or suggest that oxidizers should be absent, but in fact explicitly, repeatedly and consistently teaches their desired presence. Thus, Chang, et al. teaches away from the claimed

invention. An obviousness rejection cannot stand if the references teach away from the invention, *In re Hedges* 228 U.S.P.Q. 685, 687, 837 F.2d 473 (Fed. Cir. 1986).

A reference which leads one of ordinary skill in the art away from the claimed invention cannot render it unpatentably obvious. *Dow Chemical Co. v. American Cyanamid Co.* 816 F.2d 617, 2 U.S.P.Q.2d 1350 (Fed. Cir. 1987); *In re Grasselli, et al.*, 713 F.2d 731, 218 U.S.P.Q. 269 (Fed. Cir. 1983); *In re Dow Chemical Co.* 837 F.2d 469, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

The Examiner's attention is further respectfully directed to *In re Haruna, et al.*, 249 F.3d 1327, 1335; 58 U.S.P.Q. 2d 1517 (Fed. Cir. 2001):

"A prima facie case of obviousness can be rebutted if the applicant ... can show 'that the art in any material respect taught away' from the claimed invention." *In re Geisler*, 116 F.3d 1465, 1469, 43 U.S.P.Q.2d (BNA) 1362, 1365 (Fed. Cir. 1997) (quoting *In re Malagari*, 499 F.2d 1297, 1303, 182 U.S.P.Q. (BNA) 549, 533 (CCPA 1974)). "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, ... would be led in a direction divergent from the path that was taken by the applicant." *Tec Air, Inc. v. Denso Mfg. Mich. Inc.*, 192 F.3d 1353, 1360, 52 U.S.P.Q.2d (BNA) 1294, 1298 (Fed. Cir. 1999).

It is respectfully submitted that for this reason alone the subject rejection is overcome and should be withdrawn.

Further, Chang, et al. does not teach or suggest or hint that chelating agents are breakers – rather they are taught to increase the pH level. In the Chang, et al. teaching, column 11 line 66 to column 12 line 64, the salt of EDTA is used to complex with magnesium ions as a mechanism to increase the fluid pH above 10.5 to the more stable crosslink pH point of greater than 12.0 pH. Chang, et al. teaches how to prepare a very stable crosslinked polymer fluid, and the salt of EDTA is a part of the composition to prepare the very stable fluid. Chang, et al. does not teach using that the salt of EDTA makes the fluid unstable, especially to "break" the polymer". It appears Chang, et al. only uses EDTA to stabilize the fluid, not break it. Also, in column 19, line 13, Chang, et al. lists the salt of EDTA as a *crosslinker enhance agent*, even at a 100 pptg concentration within the gel. This specific item teaches away from the claimed invention yet again. The Applicant respectfully submits that for these additional reasons the instant rejection is overcome and should be withdrawn. Reconsideration is respectfully requested.

Additional Considerations

The Examiner's attention is respectfully directed to the additional amendments to independent claims 1 and 9 herein where the temperatures at which the method is practiced are recited. The range given in amended independent claim 1 was originally recited in dependent claim 7 (now canceled), and thus does not constitute an improper insertion of new matter.

Support for the temperature ranges presented in amended independent claim 9 is found in paragraph [0026], page 6, line 23 to page 7, line 2 of the application as originally filed, and thus these temperatures do not constitute improper insertions of new matter. The Applicant respectfully submits that none of the references taken singly or together teach or suggest these temperature ranges for these aminocarboxylic acids for methods for breaking the viscosity of aqueous fluids.

The temperature ranges recited in new dependent claims 25 and 26 are likewise supported by the application as originally filed in paragraph [0026], page 6, line 23 to page 7, line 2. These dependent claims are presented for the Examiner's additional consideration.

It is respectfully submitted that the amendments and arguments presented above overcome all of the rejections. Reconsideration, consideration and allowance of the claims are respectfully requested. The Examiner is respectfully reminded of his duty to indicate allowable subject matter. The Examiner is invited to call the Applicants' attorney at the number below for any reason, especially any reason that may help advance the prosecution.

Respectfully submitted,
JAMES B. CREWS,



David L. Mossman
Registration No. 29,570
Attorney for Applicant
Telephone No. 512/219-4026
Facsimile No. 512/219-4036